EUROPE 1992 AND CANADA'S SOFTWARE INDUSTRY

E SOFTWARE MARKET

DENMARK

1992

CANADA EUROPE

External Affairs and International Trade Canada

Canada

EUROPE 1992
AND
CANADA'S SOFTWARE INDUSTRY

THE SOFTWARE MARKET IN DENMARK

A Report Prepared by Gartner Scandinavia A/S

for

External Affairs and International Trade Canada

November 1991

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FROM THE GOVERNMENT OF CANADA

External Affairs and International Trade Canada (EAITC) is pleased to offer the Canadian software industry, as part of the Going Global trade strategy, this comprehensive study on market opportunities in the European Community resulting from the Europe 1992 initiative and the possible means by which Canadian firms can capitalize on them. This study on the Danish software market is part of a series of software market studies in the European Community.

Europe 1992 is happening now. The European Community's ambitious Single Market program has already dramatically changed the way Europeans are doing business. The process is irreversible; the pace is rapid and accelerating. If Canadian businesses are to profit from the opportunities that this enormous market will bring, they must be well informed.

After the recent completion of a series of sectoral studies entitled *1992 Implications of a Single European Market*, EAITC conducted a consultative process which included government departments, the provinces and our European embassies to determine which subsectors should be the focus of further study. The result was the selection of the ocean industry, environmental industries, software, telecommunications products and services and value-added wood products. All of these studies will be published during the Fall of 1991 and into the Spring of 1992.

We also have tangible programs to introduce you to the European market. These are well-publicized through our CanadExport publications. Our trade officers in the European Community Division of EAITC and at the International Trade Centres in each province would be pleased to respond to your specific questions. Take advantage of these programs. They have been established to benefit you.

Publications that are currently available from the series *1992 Implications of a Single European Market* include: Agriculture and Food Products; Telecommunications and Computers; Automotive Industry; Minerals and Metals; Forest Products; Defence, Aerospace and Transportation; Specialty Chemical Products, New Materials, Pharmaceuticals and Biotechnology; Industrial Products and Services; Financial Services; Fisheries Products; and Professional and Consulting Services — Law and Accounting. Other reports include European Economic and Monetary Union; Company Law; Competition Policy; Standards; Freight Forwarding; 1992 and Related Issues; Intellectual Property; and Moving into Europe — Strategic Partnering.

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MANAGEMENT SUMMARY

This report is intended to portray and analyse a number of relevant Danish software publishers in order to report the initiatives taken to export within the EEC, as well as identify and describe available European distribution channels.

We estimate that there are about 530 software developers in Denmark, including about 320 one-person "boiler-room" operations. Of the remaining 210 software developers we selected a sample of 50 with an average 1991 revenue of 20 million CDN$ and a median revenue of 7 million CDN$.

As many as 85 per cent of the Danish software developers (in our sample) agreed to joint ventures as an interesting possibility for expansion. Export expansion is one of the key issues for as many as 62 per cent of the responding sample, who appear to have definite plans either for starting new exports or for expanding existing ones. In terms of the current level of export it is not surprising that Scandinavia is the main market, with 53 per cent of the software publishers in the responding sample exporting to this market. However, a relatively high proportion (43 per cent) export to the major European markets as well, and a further 23 per cent export software applications to countries outside Europe.

The Danish software market, including application and systems software but excluding maintenance, consulting and education, had an end-user value of 502 million CDN$ at year-end 1990, rising to 652 million CDN$ by year-end 1991, an increase of 29.9 per cent.

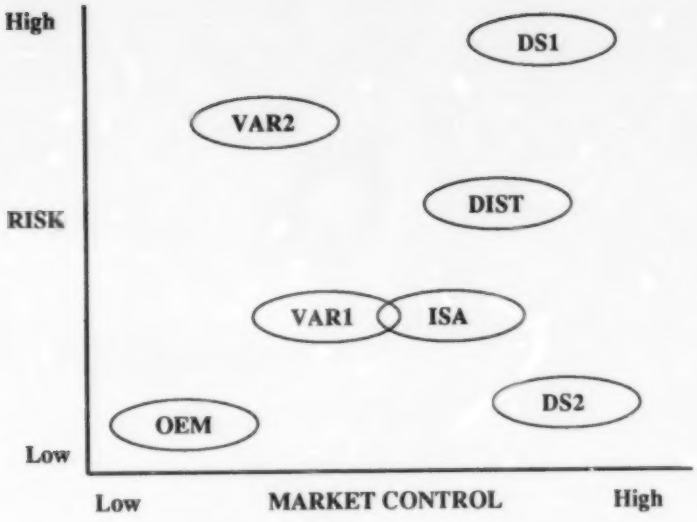
The key issue in the selection of European distribution channels is the careful evaluation of the market control required and the financial risk vs product complexity. By market control we mean the control the Canadian software developer can maintain over product marketing, image projection and brand name recognition in the target market — strategically important if the long-term plans include a local subsidiary. Financial risk we define in terms of the financial commitment necessary to establish a given distribution channel.

Depending on the nature of the product that a Canadian software developer wants to distribute in Europe, there are basically five main types and two sub-types of distribution channels available:

- original equipment manufacturers (OEMs),
- value-added resellers 1 (VARs1),
- value-added resellers 2 (VARs2),
- distributors (DIST),
- independent sales agents or representatives (ISA),
- direct sales 1 (DS1), and
- direct sales 2 (DS2).

By VAR2 we mean those cases where the software developer must station one or more of his own developers at the VAR in Europe. DS2 are the instances of direct sales in the form of mail orders. OEM is considered theoretical in software distribution, because re-labeling rarely, if ever, occurs.

We have rated the seven distribution channels in terms of financial risk and market control. In the selection of channels, the evaluation of the product's complexity must be matched against the support and maintenance capabilities offered by each channel.



A structured approach to an export initiative must begin with the evaluation of three key questions:

- Product complexity — What level of support and maintenance is required?
- Financial resources — What level of financial "patience" is available?
- Long-term export strategy — Is a local subsidiary the ultimate goal?

In the process of evaluating the above questions, decisions should be made about:

- Who should execute and pay for the local adaptation of the application?
- What discount rates are acceptable?
- What level of support is necessary and available?

Thereafter, it is time for extensive homework to:

- Identify and study relevant joint-venture partners, especially their distribution channels and financial solidity — more than one candidate should be chosen.
- Study the target markets in terms of size, growth and competition.

At this point, a critical decision must be made between whether to establish your own distribution channels directly or enter into a joint venture with a software developer that already has established distribution channels. We believe that the latter will be the most productive approach for overcoming cultural/political barriers.

- When actual contact is made with a potential "partner", plan to visit the candidates several times, both before and after an agreement is made.

Export takes a lot of patience. That is the key message. The approach, "First we become friends, then we do business in Europe", is at the heart of a sound distribution strategy, because therein is found a consistent understanding of local management, sales and support.

INTRODUCTION

During the process of interviewing the relevant software publishers we decided, at our own expense, to increase the sample from the agreed 50 firms to 80. This was done to obtain more significant data in terms of interesting export cases with their relevant success and failure ratio.

Of the sample of 80 software publishers interviewed, we obtained 48 full responses from software publishers with an average 1991 revenue of 20 million CDN$ and a median revenue of 7 million CDN$. Out of the 48 software publishers, we immediately eliminated 17 because they lacked experience or plans. The lack of in-house software development was also a criterion for initial elimination; these firms are marked NI in tables in the chapter entitled, Sample Overview. Thirty software publishers remained.

We then introduced export experience as our third criterion. We selected from the remaining 30 software publishers the ones with export experience in Scandinavia. This would indicate a strong foothold in their home market, thereby ensuring that the Canadian partner in any potential joint venture would have a strong base in and around the target country, Denmark. The additional criterion reduced the 30 software publishers to 21.

To ensure the European dimension, the fourth and final criterion was an expansion of the export experience. We selected the software publishers that had experience in exporting to other major European markets beyond Scandinavia. Twelve software publishers fulfilled all criteria.

It is interesting that, without soliciting for distributors of Canadian products in Europe, we nonetheless obtained indications of a high level of interest in Canadian products from five software publishers:

Damgaard Data A/S has already established the distribution of Local Area Network (LAN) products from a Canadian company called Pure Data, whom they suggested as a reference. Further, Damgaard Data is interested in finding a Canadian distributor for their in-house developed, PC-based economy package called Concorde. They currently obtain approximately 50 per cent of their revenue from distributing third-party products; therefore, they are extremely interested in finding suitable database application tools for distribution in Denmark.

FLS Data A/S, which currently produces UNIX, DEC VMS and VM-based administrative engineering applications, is generally interested in distributing all types of Canadian software in Denmark, as well as in the rest of Europe. They are interested in penetrating the North American market at some future date but currently have no experience in exporting package software.

KTP Data A/S has developed a modular real estate administration application based on IBM AS/400. The application's legal and taxation requirements are tailored to the Danish market, making it unsuitable for export. However, they are interested in Canadian applications in the same category for distribution in Denmark.

DanWare Data A/S, has exported its PC-based database system, Translation Manager and Dealer Manager (the latter being a stock and bond dealing system) to most European markets for four years. The main markets are Sweden, the UK and Norway. DanWare expressed specific interest in distributing Canadian products Europe-wide and expressed ambitions to begin exporting Translation Manager and Backup Manager to North America.

Damgaard Data A/S	Revenue 1991:	14 MCDN$
FLS Data A/S	Revenue 1991:	20 MCDN$
KTP Data A/S	Revenue 1991:	2 MCDN$
DanWare Data A/S	Revenue 1991:	N. d.
Unidentified	Revenue 1991:	15 MCDN$

At this early stage in the compilation of data, we found a high level of interest in joint ventures as a form of international cooperation; as many as 85 per cent of the responding sample agreed that joint ventures were an interesting expansion possibility for their own company. Export expansion is one of the key issues for as many as 62 per cent of the responding sample, who revealed they had definite plans for either starting new exports or expanding existing exports. In terms of the current level of export, it is not surprising that Scandinavia is the main export market; 53 per cent of the software publishers in the responding sample export to this market. However, a relatively high proportion (43 per cent) also export to the major European markets. A further 23 per cent export software applications to countries outside Europe.

We selected the following software publishers for further study:

The list below contains 12 software publishers; we succeeded in obtaining extensive information about interest in a Canadian export partner from seven of them.

The following exchange rates from July 30, 1991 are used for currency conversion:

100 Danish kroner = 591.4 CDN$
100 USD = 115.6 CDN$
100 French Francs = 19.3 CDN$
100 ECU = 153.0 CDN$
100 UK£ = 193.4 CDN$

Software Publisher	**Export 1990**		**Export 1991**
CMA Software	N. d.		N. d.
DAC Data	1.6 MCDN$		1.6 MCDN$
Dansk System Industri	.1 MCDN$		.3 MCDN$
Pro:Con	2.2 MCDN$		4.9 MCDN$
Unidentified	13.7 MCDN$		14.9 MCDN$
Damgaard Data	.6 MCDN$		.7 MCDN$
JDC Data	19.2 MCDN$		30.9 MCDN$
EDB Gruppen	1.5 MCDN$		2.5 MCDN$
DanWare Data	N/A		N/A
Vicorp Scandinavia	N/A		N/A
Systematic Software	.6MCDN$		1.3 MCDN$
Procoss	N/A		N/A
Average Growth	**5 MCDN$**	**42%**	**7.1 MCDN$**

METHODOLOGY

In defining the research project, we assumed that the main objective was to portray and analyse a number of relevant software publishers and, more specifically, to report on initiatives taken towards export within the EEC.

Before going into the detailed description of the project, we must define the main entity. The software publisher is a company that derives some portion of its total revenue from offering openly a software product that wholly or principally has been developed by the company itself. This does not include free-ware or proprietary offerings.

The methodology is based upon three different viewpoints, all of which are interdependent. First, the primary research collects the information available directly at the source — in this case, the managing director of the software publisher. The survey was conducted in two phases:

- An initial telephone interview of 50 software publishers. We estimate that there are about 210 relevant candidates plus about 320 one-person "boiler-room" operations. The purpose was to identify 12 interesting cases and obtain basic profile information.

- A follow-up in-depth face-to-face interview with the relevant individuals of the 12 qualified software publishers. The main objective of the interview was to obtain detailed insight into the experience in exporting software to the EEC. An attempt was also made to reveal future product and distibution plans.

Next, secondary source research validated and supplemented the primary reseach. A Scandinavian research programme called User Demand Research (UDR) provided insight into the level and type of investment made by the 1,000 largest software companies in Denmark. The main secondary sources include:

- EEC department for IT,
- Software Publishers Association Europe,
- EDB systemleverandørernes Forening,
- Gartner Group's continuous research conducted in the US and in 12 subsidiaries throughout Europe, and
- a continuous survey (UDR) of the demand for software among the Top 1,000 Danish companies.

The third angle to the research formed the technical framework for defining the relevant market and system attributes for rating the investigated software publishers in terms of their product marketing, distribution strategy and technical mission. The exact set of attributes will be defined in conjunction with the Department of External Affairs and International Trade Canada when more information is available. The main attribute categories include:

- application type,
- hardware platform,
- operating system,
- network protocol, and
- user interface.

1. THE DANISH SOFTWARE MARKET

The Danish software market (including application and systems software but excluding maintenance, consultancy and education) had a value of 502 million CDN$ in 1990, growing to 652 million CDN$ by 1991 — up 29.9 per cent. We saw a relatively high growth rate in overall software spending. A vertical split indicates that industries such as manufacturing (excluding food and beverages), banking, finance and insurance will grow at an above average rate towards the beginning of 1992. Owing to the low number of banks and insurance companies in Denmark, the calculation for those industries is based on a sample of six organizations. However, they all show the same trend in software investments. On the other hand, the growth in software investments is largely offset by saving on hardware, consultancy and (to a small degree) in personnel; consequently, we believe a large portion of the increase in software budgets will be absorbed in the total IT budget.

There are 270 mainframes in Denmark, distributed over 197 sites. The mainframe market is currently best described as static; we see no significant changes in the mix before 1992. However, we do see the beginning of a reduction in the total number of mainframes installed during 1992, mainly as a result of a consolidation of data centres. We also see end users beginning to plan the down-sizing of their applications. The mainframe market is dominated by IBM, with a 54-per-cent share of the installed base at year-end 1991, followed by Siemens (including models 75XX) with 11 per cent. HDS and Control Data have six per cent each and Unisys has four per cent. Amdahl has achieved a three per-cent share.

The mini platform is still dominated by proprietary operating systems. UNIX is running on only 16 per cent of the installed base at year-end 1990, although this will increase to 18 per cent by year-end 1991. However, we see a rapid increase in the UNIX penetration of the installed base during 1992; UNIX-based systems will account for 30 per cent of the installed base by year-end 1992.

The mini market is dominated by IBM, with a 49-per-cent share of the installed base at year-end 1991, followed by DEC with 27 per cent, HP with seven per cent and Unisys with six per cent. We expect the mini market to continue to grow during 1992 by about eight per cent.

The emergence of client/server technologies will greatly influence system and application investments on the mid-range platform. The increased down-sizing and processing on desktop will push software vendors to introduce more dynamic network licensing schemes where network pricing charges are based on the number of active log-ons. Owing to the inherent marketing attractiveness, we believe that network pricing will gain support quickly among UNIX vendors.

Packaged PC software constituted 607 million DKK with a 1990 annual growth rate of 39 per cent, which is low compared to other European markets. The leading operating system on the PC platform is still DOS (including both MS-DOS and PC-DOS); 95 per cent of the PCs installed are running on that operating system, though that figure will decline to 91 per cent during 1991. The acceptance of OS/2 (including both the standard and the extended edition) has been slowed by delays and the lack of real application functionality; consequently, OS/2 was running on only three per cent of the installed base of PCs at year-end 1990, though this will grow to eight per cent during 1991. Apple Macintosh is a niche player in terms of installed base, accounting for two per cent of the installed base at year-end 1990 and remaining static at that level during 1991. UNIX is currently running on less than one per cent of the installed base of PCs but there seems to be a trend towards greater acceptance of UNIX on the PC platform. We expect UNIX to run on between one and two per cent of the installed base at year-end 1992.

At year-end 1992 we see the first real impact of OS/2 on the PC platform; it will likely capture 15 per cent of the installed base. The increase will come almost exclusively as a result of migration from DOS installations.

In terms of processor technology, the installed base of PCs is migrating away from both the 808X and the 80286, mainly to the 80386 platform. We do not see the 80486 platform as a significant player before year-end 1993. The split per platform at year-end 1991 and 1992 will be:

	Year-end 1991	Year-end 1992
Intel 808X	12 %	10 %
Intel 80286	41 %	36 %
Intel 80386	45 %	51 %
Intel 80486	1 %	2 %
680X0	1 %	1 %

2. THE EUROPEAN PC SOFTWARE MARKET

As software sales continue to surpass hardware sales in Europe, the major trends during 1990 in tbe European software market were as follows:

- 1990 European PC software sales increased 59 per cent, to a total value of CDN$ 1.708 billion;
- 1990 was the year of MS/Windows applications, with an annual growth of 197 per cent in sales value;
- windows applications constituted 15 per cent of sales during 1990;
- Macintosh applications constituted nine per cent of sales during 1990.

The following breakdown applied to the 1990 European software sales:

Germany/Austria	CDN$ 430 million
UK/Ireland	CDN$ 389 million
France	CDN$ 334 million
Scandinavia	CDN$ 213 million
Benelux	CDN$ 150 million
Italy	CDN$ 73 million
Spain/Italy	CDN$ 68 million
Other	CDN$ 51 million
Total	**CDN$ 1.708 billion**

In terms of the value of the 1990 annual growth rates in software sales, the European country breakdown is as follows:

Germany/Austria	67 per cent
UK/Ireland	39 per cent
France	66 per cent
Scandinavia	55 per cent
Benelux	49 per cent
Italy	70 per cent
Spain/Italy	198 per cent
Other	60 per cent

As in most industrialized countries throughout the world, Microsoft Windows application sales in Europe were almost incredible during 1990: they increased by 110 per cent in the first quarter, 106 per cent in the second quarter, 243 per cent in the third quarter and 327 per cent in the fourth quarter. Windows is now the second largest European software format behind MS-DOS (and PC-DOS).

The players in the European PC software market are largely North American with Microsoft as the largest, followed by Lotus. North American PC software vendors account for approximately 70 per cent of the total European software market.

3. SELECTING A EUROPEAN PARTNER

3.1 Europe and the Rest of the World

As we move towards 1992 and unity in Europe, the European market is expanding twice as fast as the North American market. And in 1990 many software and hardware vendors published results showing close to zero growth in the North American market and a significant growth in European revenue. International revenue has become crucial to the survival of most North American vendors and can no longer be considered as easy money from a market not taken too seriously from a support point of view. Effective planning of European market penetration becomes paramount in importance because the European IT market becomes larger than the North American market after unification in 1992. The table below shows the development in geographic revenue distribution of the 100 largest IT vendors in the world.

3.2 "Do Your Homework!"

Before entering any European market the preparations of a potential Canadian joint venture partner are of great importance. This includes efforts to obtain information about trends in technology, local pricing, local industrial organizations, and cultural and political trends. In other words, all available information must be studied very carefully. The fierce battle for the attention of the quality European distribution channels has begun, and a high level of knowledge is expected of any Canadian software publisher wishing to export. Knowledge of local language issues and legal demands are essential when planning translation and localization. Most of this preparation is not necessarily very costly; one might, for example, subscribe to European IT industry magazines. We especially recommend a subscription to:

Computer Reseller Europe
2 place de Vosges, Cedex 65
92051 Paris La Défence
France
Phone: (33) 1-49.04.79.00

The subscription agency for Canada and the US is:

Edition Gosselin Inc.
228 La Colline
Aylmer (Québec)
Canada J9J 1T8
Phone: (819) 684-7885

ISSN: 1146-6456

	1987	1988	1989
		(CDN$ in billions)	
US	94.9	103.8	108.6
Europe	71.3	82.9	89.0
Asia/Pacific	51.7	66.5	71.5
Other	13.1	15.8	17.7
Total	**231.0**	**269.0**	**286.8**

Revenue growth in per cent vs previous year:

	1987	1988	1989
		(Per cent)	
US	9.1	9.3	4.7
Europe	27.2	6.3	7.4
Asia/Pacific	5.3	28.8	7.6
Other	16.0	21.0	11.7
Total	**199.7**	**232.7**	**248.1**

One year's subscription (airmail to Canada) is CDN$ 74.

Secondly, the European branch of the Software Publishers Association (SPA) has as part of its membership benefit an *International Resource Guide*, which includes detailed information on business facts, local consultants, distribution channels, resource materials and local salaries. SPA also conducts research into revenue and growth in most European markets and this is also published quarterly as a benefitt of membership. The cost of a membership is based on the member's own revenue during the last four fiscal quarters, divided into the following classes:

(applicable to non-European members)

CDN$ 0 - 1.156.000	CDN$ 673
1.156.000 - 2.311.000	CDN$ 1.209
2.311.000 - 3.467.000	CDN$ 1.607
3.467.000 - 5.788.000	CDN$ 2.005
5.788.000 - 8.090.000	CDN$ 2.403
8.090.000 - 11.557.000	CDN$ 3.061
11.557.000 - 17.335.000	CDN$ 4.530
17.335.000 - 23.113.000	CDN$ 5.999
23.113.000 - 34.670.000	CDN$ 7.989
34.670.000 - 57.783.000	CDN$ 8.662
57.783.000 - 115.567.000	CDN$ 9.994
115.567.000 - 231.134.000	CDN$ 13.315
Over CDN$ 231.134.000	CDN$ 19.972

Additional information is available from:

SPA Europe
2, Place de la Défense
World Trade Center 2
CNIT B P 416
92053 Paris La Défense
France
Phone: (33) 1 46.92.27.03
Fax: (33) 1 46 92 25 31

After thorough preparation, it is imperative that the Canadian developer travel to the markets he wishes to enter in order to meet potential distributors, speak with dealers and end users and attend trade shows. (All the significant trade shows are advertised in *European Computer Reseller* mentioned above).

3.3 Selection of Distribution Channels

Before making the critical choice of a distributor, a Canadian software developer must consider a number of critical issues:

3.31 Distribution Channels: A Question of Risk vs Control

Depending on the nature of the product that a Canadian software developer wants to distribute in Europe, there are five main types of distribution channels available:

3.311 Original Equipment Manufacturers (OEMs)

3.312 Value-added Resellers (VARs)

3.313 Distributors

3.314 Independent Sales Agents or Representatives

3.315 Direct Sales

3.311 Original equipment manufacturers (OEMs) sell or license under their own brand name, bundled with the OEM's own hardware platform. This is a common marketing strategy used by hardware vendors to make their own products more attractive, because only the right functionality will attract end-user interest. The drawback to this approach is that the developer's own name and trademark are never seen. This slows down potential marketing under the developer's own brand name. **Since re-labeling rarely if ever occurs, OEM is considered theoretical in software distribution.**

3.312 Value-added resellers (VARs): While OEMs bundle together two compatible products, VARs take two similar products and integrate or bundle them into an enhanced solution. The VARs are often much smaller in size than the OEMs and are often focused vertically. However, VARs will normally market the bundled product using both the name of the developer and their own name. Most European distributors generally provide value-added services, although the quality of the value-added services that potential Canadian software developers will get is closely connected to the discount rate they are willing to offer. Discount rates between 50 and 70 per cent off the local price are expected. Complex software solutions that require local individual adaptation at the end-user level will require even higher discount rates.

3.313 The distributor's main obligation is to invest in advertising and marketing programmes to obtain a profitable market awareness. The distributor will normally have established a number of retailers who will sell to the end user. The developer should try to retain the right to bypass the distributor if it becomes attractive to deal with a large retailer directly.

3.314 Independent sales agents or representatives merely solicit sales; they assume no economic or legal risk for sales or marketing. Agents or representatives are useful in the case of highly specialized and geographically diversified products. Often the best agents or representatives are consultants who recommend the software product as a value-added part of their consultancy services. Commission rates vary, depending on the product type and the services demanded from the sales agents or representatives, from two to about 20 per cent.

3.315 Direct sales can take two basic forms:

a. Direct sales force

To establish a direct sales force in Europe involves the greatest financial commitment. In return for committing resources to a direct sales force, the developer retains direct control over all interactions with the market and, when sales are successful, a higher gross margin. A direct sales force should consist of local staff. Consequently, the developer becomes an employer in the EC with all the attendant costs and responsibilities under local law, which should be studied carefully before any commitments are made. Most European developers of package software are moving away from direct sales. Highly technical packages and/or those that require support will often still be sold through a direct sales force.

b. Mail order

Mail order is becoming an increasingly popular form of distribution for package software that requires little or no support. In Denmark, the mail order company Computer Mail A/S has been operating successfully for the last five years. However, Pan-European mail order companies have not yet seen the light of day owing to incompatible postal rules throughout Europe, although they are likely to be harmonised within the EEC. Mail order should not be mixed with other forms of distribution because the price difference will be disruptive.

3.32 The Economics of a Local Presence

There are three options in terms of local presence:

- sales representatives,
- a European headquarters, or
- local country subsidiaries.

If developers decide to have no local presence they must plan to visit the distributor at least once a quarter. A sales representative will decrease the cost of visiting distributors and establish a more continuous contact because he is not handicapped by the time difference between Canada and Europe. The developer obtains the greatest insight and control by establishing either a European or a local subsidiary. However, this approach demands a revenue of at least CDN$ 1.73 million per person employed. Furthermore, the legal rights of the employees must be studied carefully since the cost of a potential staff reduction in most European countries is higher than in North America. Also, the cost of employees is about 20 to 25 per cent higher compared with North America.

3.33 Can Exclusive Distribution Be Offered?

The distributor expects to obtain exclusive regional rights to distribution in return for investments in marketing, manpower and market knowledge. The "mind-share" that the products receive increases dramatically, mainly owing to the greater profitability and the potential ability to dominate the local market. A key issue is what strategy the Canadian software developer will implement to avoid "grey marketing" — parallel importing from North American or Canadian mail order companies, where the street price is often lower than the European wholesale price, for example. "Grey marketing" can often be curbed through tight control of the serial numbers of upgrades. Still, a Canadian software

developer wishing to export to Europe should beware of the distributor's own product mix, since overlapping products might cause the distributor to "bury" the Canadian product.

3.34 What Marketing Support Can Be Offered?

The value-added distributors will customize all marketing to the local market. Nevertheless, the distributor will expect extensive support including technical information, bug lists, press releases, press reviews, marketing information, advertisements (including film), demo disks or versions. One of the pitfalls an exporting Canadian software developer should avoid is underestimating the importance of an intensive information flow into the distribution channels. A product that is accompanied by good marketing information will improve the competitive position of the distributor and therefore receive a greater "mind-share". Furthermore, the marketing support is a way for a software developer to influence local marketing, which could be an advantage if a homogeneous image is desired.

3.35 How Will the Adaptation to Local Needs Be Made?

All administrative and office productivity application products must be translated into the local language in all countries. A few technical/scientific niches may initially be marketed in an English version, but in southern Europe (especially Spain, Italy, France and Greece) the technical/scientific applications must also be translated before they can be marketed effectively. Systems and tools software should generally not be translated. The main issue is how the developer will control the translation of applications and ensure that the distributor remains serious. We see three relevant models:

- The translation is paid for and carried out by the distributor, who is wholly or partly compensated through higher discount rates and greater advertising support.
- The translation is carried out as a joint development where the distributor commits human resources and it is paid mostly by the developer. The translation should take place locally and the payment for translation as well as the distribution rights should be tied to successful completion of the translation.
- The translation is paid for and carried out by the developer.

We suggest a version of the second option because the commitment of human resources will ensure the seriousness and increase the competence of the local support. It is of paramount importance that the developer be responsible for the project in order to maintain control. For example, the translation of Informix Inc.'s SMARTWare into Danish was originally budgeted at CDN$ 75,000. It ended up costing in the area of CDN$ 170,000, paid by Informix Inc. to date. And the translated product is still not available, mainly due to a lack of project control at Informix Inc. and a large turnover in the distributor's staff. By comparison, the cost of translating Lotus 1-2-3 into Danish was in the area of CDN$ 100,000.

3.36 How Will the After-sale Service Be Organized?

The large European end users learn when upgrades are available in the US or Canada through industry magazines. This means that they expect timely upgrades in the local European countries. This, in turn, means that plans for upgrades should include plans for translation and distribution. It is most important to keep the distributors informed of upgrade plans — they should always be better informed than their end user clients. After-sale services must also include timely bug lists, technical notes, answers to common technical questions and bug work-arounds.

3.37 What Pricing Policies Apply to the European Market?

Prices in Europe will vary a great deal from country to country, though they are generally higher than on the North American market. The only comparable inter-European prices that exist are for packaged PC applications.

The prices listed on the next page are in CDN$, and based on April 91 data collected from suppliers and the following exchange rates: 1 UK£ = CDN$1.934 = US$1.2 = 10.05 French Francs = 2.98 Deutschmarks = 2198 Lire. The European Package PC software list prices are, on average, 95 per cent higher than in North America. Prices also fluctuate throughout Europe. Average UK pricing is only 54 per cent higher than North American, while in Italy average prices are 112 per cent higher. The price differences are the result of four main factors:

		US	UK	France	Germany	Italy
Microsoft	PC Word	511	764	863	967	835
	Excel	563	764	959	967	874
Software Publishing	Write Plus	282	482	528	514	526
Ashton-Tate	dBase IV	903	1 151	1 624	1 621	N. d.
	Applause II	563	760	756	940	694
Borland	QuattroPro	449	578	957	843	833
Lotus	1-2-3 v. 2	449	764	957	839	781
Autodesk	Autocad	2 843	4 835	6 734	7 138	7 037

3.371 *Translation and Local Adaptation*

3.372 *Cost of Sales*

3.373 *Currency Hedge*

3.374 *Extra Profit*

3.371 Depending on the popularity of the product, 15 to 20 per cent of the price difference between the US and Europe is made up of translation costs and other local adaptations.

3.372 The cost of sales (including employee costs) are 20 to 25 per cent higher in Europe than in North America.

3.373 European currencies fluctuate on average +/- ten per cent against the US$; the hedge is translated into an equally higher price. Inter-European currency fluctuations are limited to 2.25 per cent, on average, except for the UK and Spain, where the limit is six per cent, as agreed to by the EC exchange rate cooperation: EMS.

3.374 Up to 30-per-cent profit compared with US margins is possible mainly because of the lack of market transparency and relatively low penetration throughout Europe.

4. THE EUROPEAN COMMISSION'S SOFTWARE COPYRIGHT DIRECTIVE

On December 13, 1990, the European Community's Council of Ministers approved a directive that will harmonize software copyright legislation effective January 1, 1993. The story behind the directive is that only France, Germany, Spain and Denmark currently have legal regulations covering software copyrights. Lack of legislation and prosecution is currently responsible for an annual loss of up to seven per cent of the European software market. The primary objective of the directive is to introduce copyright protection in countries that currently have none. The secondary objective is to harmonize legislation within the EC, although because this directive is subject to local interpretation and execution, harmonization is not likely to occur until two or three years after the directive takes effect.

4.1 The Content of the Copyright Directive

The directive gives software the same legal protection as literature and art, which means that only the expression of an idea, not the idea itself, can be protected by copyright. The copyright has a duration of 50 years. The directive gives only a clouded definition of a software program: "a series of instructions with the purpose of making a computer execute its functions". This definition includes all manuals.

The copyright described in article 4 of the directive secures the author's sole right to:

- reproduction,
- translation and re-arrangement, and
- public distribution.

Furthermore, each of the member countries must deal locally with the circulation and possession of illegal copies of software.

4.2 Exceptions to the Copyright

Article 5 of the directive contains exceptions to article 4, which will protect necessary rights in connection with the use of software. The main points are as follows:

- Backup copies are allowed if necessary to execute the software program.
- Investigation through normal usage to establish the ideas and principles on which the software is based is allowed if the software is legally acquired.
- Reproduction, translation and re-arrangement is allowed if necessary to make the software function as it is intended to, provided the software is legally acquired.

The exceptions stand unless other terms have been expressly agreed upon. This means that the current Shrink Wrap Licensing practice probably will become invalid. According to this practice, the developer encloses certain conditions for the user to read before usage, even though the user's knowledge of certain terms is by no means the same as an agreement. A developer that wants other or extra copyright protection is advised to get a written acceptance from the user.

4.21 Permission for Reverse Engineering

Without doubt, the most controversial issue debated during the last two years has been reverse engineering. Underlying the debate is the need to create interoperable software when working towards open systems and the need to ensure that proprietary knowledge does not stop the development of such systems. The directive grants limited rights to reverse engineer software programs if the sole purpose is to create compatible applications or systems software. A quote from article 6 of the directive states clearly that reverse engineering is permissible only when it is "indispensable to obtain the information necessary to achieve interoperability". Article 6 further states that:

- Reverse engineering may be performed only by the licensee or by another person who has a right to use a copy of a program.
- The information necessary to achieve interoperability must not previously have been readily available.

- Reverse engineering must be confined to the parts of the original program necessary to achieve interoperability.

The protection against using reverse engineering to reveal trade secrets and/or create competitive products is ensured by emphasizing that reverse engineering cannot be used "for the development, production or marketing of a program substantially similar in its expression (to the original) or for any other act that infringes upon the copyright".

4.3 What Was Left Out of the Directive?

The European Committee for Interoperable Systems (ECIS), which is an organisation of users, and software and hardware vendors, has been the strongest supporter and lobbyist in favour of reverse engineering. They originally proposed less restrictive reverse engineering control (which was included in the first draft of the directive). The committee favoured, for example:

- the right to reverse engineering for maintenance purposes,

- the right to reverse engineering of hardware to obtain interoperability between operating systems and a hardware platform.

4.4 The Directive is Not Final

After the European Community's Council of Ministers approved the common position to the directive on December 13, 1990, the directive went back to the European Parliament for final adoption, probably in October or November, 1991. Even though the European Parliament has the opportunity to propose alterations to the current directive, it is unlikely that the Council will approve them since none of the member countries have posed any objections to the current directive. Still, ECIS will try to influence the decision-making process.

5. OVERVIEW OF THE EASTERN-BLOC COUNTRIES

In November 1989, the Berlin wall came crashing down with no warning, leaving, almost overnight, the former satellite states with the task of catching up on 40 years of market economic illiteracy inherited from centrally planned economies.

From a packaged software point of view the paramount problem is the lack of infrastructure and a mind-set incompatible with the concept of market economy, which has left these countries with very scarce distribution channels, if they have any at all. Consequently, volume sales are almost impossible to obtain. Lack of hard currency and virtually no copyright legislation have presented opportunities for unhindered software piracy. For example, without having sold a single licensed Wordstar package in Hungary, the company's software is currently the market leader for PC wordprocessors. Other vendors have taken the approach of dumping prices in the hope of making software piracy unattractive.

Since standards were non-existent, leading vendors like IBM, Microsoft, Ashton-Tate, Lotus and Hewlett-Packard, as well as a number of Eastern firms, agreed in July 1990 on a common code for software standards. Because they agreed to make IBM's code page 852 the standard, the same software package can now be sold and used throughout Czechoslovakia, Hungary, Poland and Yugoslavia. The Soviet Union still conforms to its own standard.

5.1 Basic Data on the Eastern-bloc Countries

5.11 The Soviet Union

Population: 290 million (1991)

GNP per capita: CDN$ 5,940

Most computer installations are mainframes and minis, found in large industries and government departments. Personal computers are very few and far between. Most of them are based on the Intel 8088 or 8086 processors and come from Taiwan.

5.12 "East" Germany

Population: 16.6 million (1988)

GNP per capita: CDN$ 10,863

Thanks to the former Robotron (the state owned East German manufacturer of informatics products) "East" Germany has around 160,000 PCs.Reunification has accelerated foreign investments in this country more than anywhere else in Eastern and Central Europe.

5.13 Poland

Population: 38 million (1991)

GNP per capita: CDN$ 10,517

Despite a strong inflation rate — 244 per cent yearly — the country is on its way to a more profit-conscious economy: the national currency, the "zloty", is now convertible on the domestic market and, between January and June 1990, more that 30,000 private businesses were established.

5.14 Czechoslovakia

Population: 16 million (1991)

GNP per capita: CDN$ 8,205

The long-awaited economic reforms have yet to materialize but some of them — in particular the convertibility of the Czech crown — should see the light of day in 1991.

5.15 Hungary

Population: 10.6 million (1991)

GNP per capita: CDN$ 2,774

After former East Germany, Hungary is considered to be the most advanced in computer technology. Most of the personal computers are imported either from East Germany, Western Europe, Taiwan or Japan.

5.16 Romania

Population: 23 million (1991)

GNP per capita: CDN$ 3,351

With a base of some 360 mainframes, a few hundred compatible PCs and a few dozen imported ATs, Romania lags some 20 years behind Western technology.

5.17 Bulgaria

Population: 9 million (1991)

GNP per capita: CDN$ 8,205

Bulgaria is one of the Central European nations that suffered the most from the breakup of Comecon. Its PC sales to the Soviet Union are today greatly reduced owing also to a lack of component supplies from Czechoslovakia.

5.18 Yugoslavia

Population: 24 million (1991)

GNP per capita: CDN$ 3,351

The current political crisis is threatening the planned economic reforms and making foreign companies hesitant to invest, even though the Dinar is now in the foreign exchange system.

6. COMPANY PROFILES

6.1 CMA Software A/S

Address: Marielundsvej 46B ❑ 2730 Herlev

Phone: 42 91 88 33

1st Contact: Svend Brøsted ❑ Sales and Marketing Director

2nd Contact: Jan Andersen ❑ Managing Director

	1989	1990	1991 (Est.)
Revenue (MCDN$):	N. d.	N. d.	6.4
Employees:	22	24	25
Developers:	30	32	40

Product and Business Summary:

CMA Software A/S develops and sells IBM mainframe (and compatible mainframe) systems software running under MVS and VSE. The products are not industry specific. Applications include printer spooling, time sharing and PC-to-mainframe data transfer.

Main areas of business:

Own development of standard applications	YES
Custom proprietary application development	NO
Body-shopping	NO
Fixed price enterprise projects	NO
Facilities management	NO
Hardware supplier (of CPUs)	NO
Service bureau	NO
Other	NO

Product portfolio (own development only):

1.	Name:	CMA-Spool
	Hardware platform:	IBM mainframe
	Operating system:	MVS, VSE
	Development language:	Assembler
	LAN protocol:	n/a
	Adaptation needed:	YES (parameters only)
	Industry specific:	NO

2.	Name:	CMA-TSO+
	Hardware platform:	IBM mainframe
	Operating system:	MVS
	Development language:	Assembler
	LAN protocol:	n/a
	Adaptation needed:	YES (parameters only)
	Industry specific:	NO
	Function:	Time sharing under MVS
3.	Name:	CMA-Shuttle
	Hardware platform:	IBM mainframe
	Operating system:	MVS, VSE
	Development language:	C
	LAN protocol:	n/a
	Adaptation needed:	YES (parameters only)
	Industry specific:	NO
	Function:	PC-to-mainframe data transfer

Export Experience:

Current distribution channels: Subsidiaries and distributors

Export products:

Name	Target country	No. years
CMA-Spool	all West-European US Canada Japan Brazil Australia	4
CMA-TSO+	same as CMA-Spool	6

Per cent of revenue from export: 1990: 80 per cent 1991: 85 per cent

Export expansion are planned in: Eastern Europe and the Middle East

Interested in joint ventures: YES

What Does CMA Software A/S Require of a Canadian Joint-venture Partner?

CMA Software A/S was very specific that they are interested only in potential joint-venture partners that have extensive experience with IBM mainframe system software. Furthermore, they made it clear that they were interested in a potential joint venture only if the product and organizational aspect was a perfect match. Their own products fall into the categories of printer spooling (CMA-Spool), time sharing under MVS (CMA-TSO+) and high speed data transfer (CMA-Shuttle) — all running under MVS and VSE, except CMA-TSO+ which runs only under MVS. These system software categories must be considered when approaching CMA Software A/S, since a high degree of competence in these areas will be expected. The potential Canadian partner should also have a product portfolio almost exclusively focused on IBMs or the plug-compatibles (PCM) high-end platform. In geographical

terms, they were especially interested in the North American market, since they have successfully penetrated the European market.

What Canadian Product Types is CMA Software A/S Interested in Distributing?

CMA Software A/S was unwilling to elaborate further on the fact that they were interested in the distribution of IBM and PCM mainframe system software. It was clear that they were nervous about revealing much of their product marketing strategy before direct contact with a potential Canadian software developer.

What Specific Export Experience Has CMA Software A/S Had?
Having exported CMA-TSO+ since 1986 and CMA-Spool since 1988 to all of Western Europe, North America, Canada, Japan, Brazil and Australia, and with over 80 per cent of its revenue coming from these markets, CMA Software A/S is one of the most experienced software exporters in Denmark.

6.2 DAC-Data A/S

Address: Kummerowsvej 7 ❑ 9400 Nørresundby

Phone: 98 17 11 88

1st Contact: Jørgen Østerheden

	1989	1990	1991 (Est.)
Revenue (MCDN$):	22	16	16
Employees:	170	90	n/a
Developers:	43	10	n/a

Product and Business Summary:

DAC Data A/S develops and sells vertical applications, mainly for the manufacturing, publishing and process industries. However, they also sell applications to the wholesale industry and they market a non-industry-specific financial package. All applications are developed for the IBM AS/400, S/36 or S/38 platform, because DAC Data A/S is an IBM AS/400 agent.

Main areas of business:

Own development of standard applications	YES
Custom proprietary application development	YES
Body-shopping	YES
Fixed price enterprise projects	YES
Facilities management	YES
Hardware supplier (of CPUs)	YES
Service bureau	NO
Other: Consulting and training	YES

Product portfolio (own development only):

1.	Name:	Up To 400 DEB/KRED/FIN
	Hardware platform:	36, 38, AS/400
	Operating system:	OS-400
	Development language:	RPG 3. CASE TOOLS
	LAN protocol:	n/a
	Adaptation needed:	YES
	Industry specific:	NO
	Function:	Financial system
2.	Name:	Up To 400, Wages
	Hardware platform:	36, 38, AS/400
	Operating system:	OS-400
	Development language:	RPG 3.
	LAN protocol:	n/a
	Adaptation needed:	n/a
	Industry specific:	n/a
	Function:	Financial system
3.	Name:	OFL (Orders, Invoicing, Storage)
	Hardware platform:	S-36, S-38, AS/400
	Operating system:	OS-400
	Development language:	RPG 3.
	LAN protocol:	n/a
	Adaptation needed:	YES
	Industry specific:	Wholesale
4.	Name:	MAPICS/DB
	Hardware platform:	S-36, AS/400
	Operating system:	OS-400
	Development language:	RPG 3.
	LAN protocol:	n/a
	Adaptation needed:	YES
	Industry specific:	Process industry
5	Name:	OPV SYSTEM
	Hardware platform:	n/a
	Operating system:	n/a
	Development language:	n/a
	LAN protocol:	n/a
	Adaptation needed:	YES
	Industry specific:	Production industry
6	Name:	UP TO 400
	Hardware platform:	AS/400
	Operating system:	OS-400
	Development language:	RPG
	LAN protocol:	n/a
	Adaptation needed:	YES
	Industry specific:	Manufacturing industry, newspapers

7.	Name:	UP TO 400
	Hardware platform:	AS/400
	Operating system:	OS-400
	Development language:	RPG .
	LAN protocol:	n/a
	Adaptation needed:	YES
	Industry specific:	Manufacturing industry, publishing
8.	Name:	DAC TRÆLAST
	Hardware platform:	IBM S/36
	Operating system:	n/a
	Development language:	n/a
	LAN protocol:	n/a
	Adaptation needed:	YES
	Industry specific:	Manufacturing of lumber

Export Experience:

Current distribution channels: Vendors

Export products:

Name	Target country	No. years
UP TO 400	Norway/Sweden	3
	Germany	n/a

Per cent of revenue from export: 1990: 10 per cent 1991: 10 per cent

Export expansion is planned in: UK, Germany, Holland, Switzerland and Poland

Interested in joint ventures: YES

What Does DAC-Data A/S Require of a Canadian Joint-venture Partner?

DAC-Data A/S will expect a potential Canadian joint-venture partner to be dominant in vertical solutions for the manufacturing and retail industry on the IBM AS/400 or the S/930 platform. The potential partner must also have experience in RPG 2 and 3 development. They would be interested in finding a Canadian partner to cooperate with the translation of their standard economy application, both from a language and a legal point of view. The translated application would be jointly marketed and sold primarily in the North American market. Further, they would be interested in joint development projects in EDI to add a communication module to the economy application using the EDIfact standard. They currently have a communication development project with one of the Danish PT&Ts called JTAS.

What Canadian Product Types Is DAC-Data A/S Interested in Distributing?

Basically, they are interested in all industry-specific applications for the IBM AS/400 platform. A possible joint venture could result in an arrangement where DAC-Data A/S, with its connection to various industrial organizations, could work with a specific industrial organization to evaluate and further develop a Canadian vertical application in order to adapt Danish (and other European countries') business practices and legal demands.

After the joint development process DAC-Data A/S could start distributing the final product through their existing distribution channels, probably by moving into Denmark, Sweden and Norway as initial target markets. However, as DAC-Data A/S has further specific plans to export to the UK, Germany, Holland, Switzerland and Poland, there is future potential. The limitation of DAC-Data A/S as a joint-venture partner is their current distribution strategy of selling into Danish multinational companies in Denmark and expanding through the international subsidiaries of these firms. But if they learn how to gain leverage from the reference installations obtained internationally through Danish subsidiaries, and thereby to build a distribution network, they could have a larger export potential.

What Specific Export Experience Has DAC-Data A/S Had?

DAC-Data A/S has had some good experiences cooperating in horizontal export activities with other Danish software and hardware vendors funded with EEC support. Export through these horizontal export cooperative ventures has primarily been targeted at the German market, where they set up a distributor for their application for the newspaper publishing industry.

6.3 EDB Gruppen A/S

Address: Postboks 249, Birk ❑ 7400 Herning

Phone: 97 22 33 11

1st Contact: Erik Ove Nielsen ❑ Managing Director

	1989	1990	1991 (Est.)
Revenue (MCDN$):	15	22	25
Employees:	300	330	350
Developers:	200	250	260

Product and Business Summary:

EDB Gruppen A/S is one of the largest Danish software developers. They focus primarily on financial applications for the IBM mini and mainframe platforms. Normally, they customize their basic financial application to the client's individual needs, which includes industry-specific adaptation. EDB Gruppen A/S mainly addresses textile and clothing, order- and series-production, retail and wholesale industries. They also have modules for payroll and marketing.

Main Areas of Business:

Own development of standard applications	YES
Custom proprietary application development	NO
Body-shopping	YES
Fixed price enterprise projects	YES
Facilities management	YES
Hardware supplier (of CPUs)	YES
Service bureau	YES
Other	

Product Portfolio (own development only):

1.	Name:	Accounting
	Hardware platform:	IBM - AS/400, S/370 and ES 9000
	Operating system:	VSE, VM-SQL and MVS
	Development language:	Cobol (370) and APG-3 (AS/400)
	LAN protocol:	n/a
	Adaptation needed:	NO
	Industry specific:	n/a

Export Experience:

Current distribution channels: Subsidiaries

Export products:

Name	Target country	No. years
Accounting	Benelux	3
	Norway	10
	Canada	1

Per cent of revenue from export: 1990: 7 per cent 1991: 10 per cent

Export expansion is planned in: Canada

Interested in joint ventures: YES

EDB Gruppen A/S did not wish to comment further at this time on what they require of a potential Canadian joint-venture partner or on areas of interest in distribution.

6.4 JDC Data A/S

Address: Hældgervej 165 ❑ 7120 Vejle Øst

Phone: 75 81 64 00

1st Contact: Bo Melson ❑ Marketing Director

	1989	1990	1991 (Est.)
Revenue (MCDN$):	52	55	62
Employees:	500	500	500
Developers:	112	112	112

Product and Business Summary:

JDC Data A/S is wholly owned by NCR Denmark and JDC Data A/S is a NCR VAR. However, they originate out of the service bureau business from which they diversified. The primary vertical focus of JDC Data A/S is on the car industry, where they have applications for car retail and petrol sales. From a technical point of view, they concentrate on UNIX development for the NCR and IBM mini and PC platform. They are currently in a beta-test with a PC-based human resource management application developed under Informix's SMARTWare integrated PC package.

Main Areas of Business:

Own development of standard applications	YES
Custom proprietary application development	YES
Body-shopping	YES
Fixed price enterprise projects	YES
Facilities management	YES
Hardware supplier (of CPUs)	YES
Service bureau	YES
Other	

Product Portfolio (own development only):

1.	Name:	AD-2000
	Hardware platform:	UNIX - ATOT, SCO -UNIX
	Operating system:	UNIX
	Development language:	C + MFCOBOL
	LAN protocol:	TCP-IP
	Adaptation needed:	YES
	Industry specific:	Car retail sales
2.	Name:	OKTAN-2000
	Hardware platform:	UNIX and IBM PC'S
	Operating system:	UNIX and DOS
	Development language:	C
	LAN protocol:	n/a
	Adaptation needed:	YES
	Industry specific:	Petrol retail sales

Export Experience:

Current distribution channels: Subsidiaries

Export products:

Name	Target country	No. years
D-2000	Norway/Sweden	10
	Finland/Germany	4
	Great Britain	1
OKTAN-2000	Norway/Sweden	10
	Finland/Germany	4
	Great Britain/Australia	1

Per cent of revenue from export:	1990: 35 per cent	1991: 50 per cent
Export expansion is planned in:	Europe	
Interested in joint ventures:	YES	

JDC DATA A/S did not wish to comment further at this time on what they require of a potential Canadian joint-venture partner or on areas of interest for distribution.

6.5 Systematic Software Engineering A/S

Address: Søren Frichsvej 42 ❑ 8230 Åbyhøj

Phone: 86 15 18 66

1st Contact: Michael Holm

	1989	1990	1991 (Est.)
Revenue (MCDN$):	n/a	n/a	3
Employees:	28	32	n/a
Developers:	23	26	n/a

Product and Business Summary:

Systematic Software Engineering A/S's software services cover all phases from concept analysis, requirement specification and systems implementation to life cycle support. They are strongly involved in the defence industry with command, control and communications systems and systems for public services that require high availability and reliability. Systematic Software Engineering A/S will put resources into developing commercial EDI applications.

Main Areas of Business:

Own development of standard applications	YES
Custom proprietary application development	YES
Body-shopping	NO
Fixed price enterprise projects	YES
Facilities management	YES
Hardware supplier (of CPUs)	YES
Service bureau	YES

Product Portfolio (own development only):

1.	Name:	IRIS
	Hardware platform:	IBM and UNIX
	Operating system:	DOS, OS/2 and UNIX
	Development language:	C + ADA
	LAN protocol:	n/a
	Adaptation needed:	NO
	Industry specific:	Military defence
2.	Name:	EDI
	Hardware platform:	DEC VAX
	Operating system:	VMS - UNIX
	Development language:	ORACLE
	LAN protocol:	n/a
	Adaptation needed:	NO
	Industry specific:	n/a
	Function:	Communication
3.	Name:	POLAR
	Hardware platform:	IBM
	Operating system:	OS/2
	Development language:	C
	LAN protocol:	n/a
	Adaptation needed:	YES
	Industry specific:	manufacturing of paperboard and paper boxes

Export Experience:

Current distribution channels: Distributors

Export products:

Name	Target country	No. years
IRIS	Germany/Italy	n/a
	Belgium/Canada	n/a
	Holland/UK	5
	UK/Australia	1
NEDB	Italy/Canada	n/a
	Germany	1
EDI	Norway/Sweden/Germany	5

Per cent of revenue from export: 1990: 15 per cent 1991: 25 per cent

Export expansion is planned in: Australia/ all NATO-countries

Interested in joint ventures: YES

What does Systematic Software Engineering A/S Require of a Canadian Joint-venture Partner?

Systematic Software Engineering A/S expects a potential joint-venture partner to have a similar product portfolio, i.e. business interests in defence projects and commercial EDI, particularly in electronic warfare tools for analysing electronic noise and radar jamming. They have recently started a distribution relationship with a Canadian company called MEL Defence (which has just been bought by the North American company, Lockheed). MEL Defence will invest in IRIS, based on the Nato standard ADatP-3 (parallel to the US standard US-MTF). In EDI, Systematic Software Engineering A/S has an interest in UNIX and PC-based solutions based on multi-media user interfaces like graphical interface (X-windows and Presentation Manager), touch-sensitive screens and the Computer Sound Interface. They are also involved in EDI systems based on ODA for transmission of graphics and drawings.

What Canadian Product Types Is Systematic Software Engineering A/S Interested in Distributing?

The firm is primarily interested in commercial EDI products based on X.400, EDIFact, OLTP or FTAM. However, they are also interested in defence applications, especially from software developers with experience in GIS (Graphical Information Systems). Currently they export to Germany, Italy, Belgium, Canada, Holland, the UK, Australia, Norway and Sweden. They have specific plans to expand into the Eastern-bloc countries, although they are awaiting more transparency in terms of infrastructure and convertible currencies. They will probably start out with the part of Germany formerly known as East Germany.

What Specific Export Experience Has Systematic Software Engineering A/S Had?

Good and reliable personal local contacts have been the success criteria for establishing business relations. The firm operates on the principle that "first we become friends, then we do business". They have had great success in penetrating the Swedish and Norwegian markets with EDI products. On the other hand, the UK has posed a problem, mostly because of the very conservative business culture in that country. The UK is a market they feel could be penetrated more easily in cooperation with a Canadian software developer, partly because of Canada's membership in the Commonwealth.

6.6 PRO:CON A/S

Address: Postboks 196 ❑ 2605 Brøndby

Phone: 43 63 22 66

1st Contact: Gunnar Fredlund

	1989	1990	1991 (Est.)
Revenue (MCDN$):	3	4	8
Employees:	59	59	59
Developers:	30	30	30

Product and Business Summary:

Pro:Con A/S develops applications for the travel and manufacturing industries to run under UNIX on the DEC VAX or IBM platform. Pro:Con A/S develops applications in 4GL with Oracle as the backend database.

Main Areas of Business:

Own development of standard applications	YES
Custom proprietary application development	YES
Body-shopping	NO
Fixed price enterprise projects	YES
Facilities management	NO
Hardware supplier (of CPUs)	YES
Service bureau	NO
Other	

Product Portfolio (own development only):

1.	Name:	TAS
	Hardware platform:	UNIX
	Operating system:	UNIX (AIX)
	Development language:	Cobol
	LAN protocol:	n/a
	Adaptation needed:	YES
	Industry specific:	Travel agencies
2.	Name:	PROMIS
	Hardware platform:	UNIX and VAX
	Operating system:	VMS - UNIX
	Development language:	ORACLE SQL
	LAN protocol:	n/a
	Adaptation needed:	Yes
	Industry specific:	Manufacturing

Export Experience:

Current distribution channels: Distributors and VARs

Export products:

Name	Target country	No. years
TAS	Germany	1.5
	US	1.5
	Spain	0.5
	Scandinavia	3
Promis	Germany	1.5
	US	1.5
	Spain	0.5
	Scandinavia	3

Per cent of revenue from export: 1990: 50 per cent 1991: 60 per cent

Export expansion is planned in: Japan, Canada and a deeper coverage of existing markets

Interested in joint ventures: YES, for supporting products.

What Does PRO:CON A/S Require of a Canadian Joint-venture Partner?

Pro:Con A/S will expect a potential Canadian joint-venture partner to have experience in 4GL development under UNIX (Ultrix or AIX) with interface to one or more relational database management systems (RDBMS), preferably Oracle as a minimum. As Pro:Con A/S develops primarily for the travel and manufacturing industries, the potential Canadian partner should have complementary technologies that could integrate with the TAS or Pro:MIS applications. Industrial data capturing, process control and CAD systems could be possible complementary technologies.

What Canadian Product Types Is PRO:CON A/S Interested in Distributing?

Pro:Con A/S would be interested in technology that could be integrated into their existing applications. Currently Pro:Con A/S is developing additional modules to the Travel Agency Systems (TAS) which includes facilities such as Satellite Ticket Printing, implants, and Automated Ticket and Boarding pass (ATB). A potential Canadian partner with experience in these application areas would have a high likelihood of establishing a profitable relationship with Pro:Con A/S, especially as approximately 12 per cent of all tickets issued in Scandinavia are handled by the TAS system.

What Specific Export Experience Has PRO:CON A/S Had?

The European distribution channels have been consultants and Value Added Resellers (VARs). A complementary sales tactic was often used where the consultants used the Pro:Con A/S applications as part of a larger consulting project. Often the applications are crucial to getting the contract in the first place. In much the same way the VARs, who are often DEC or IBM agents, use the application to sell CPUs, training and consulting. Also Pro:Con A/S has succeeded in establishing a direct contact with various national manufacturing industry organizations, who in some cases have work groups specialising in applications development and communication standards.

6.7 DanWare Data A/S

Address: Herlev Hovedgade 195 ❑ 2730 Herlev

Phone: 44 53 25 25

1st Contact: Peter Grøndal

	1989	1990	1991 (Est.)
Revenue (MCDN$):	n/a	n/a	n/a
Employees:	15	20	59
Developers:	n/a	n/a	n/a

Product and Business Summary:

DanWare Data A/S focuses on the part of the financial industry that manages and trades financial instruments such as stocks, bonds, futures, options and currency. DanWare Data A/S's development is dedicated to the PC platform under DOS, Windows and OS/2 and networked under IBM NETBIOS or IPX (Novell).

Main Areas of Business:

Own development of standard applications	YES
Custom proprietary application development	YES
Body-shopping	YES
Fixed price enterprise projects	YES
Facilities management	NO
Hardware supplier (of CPUs)	NO
Service bureau	NO

Product Portfolio (own development only):

1.	Name:	Dealingmanager
	Hardware platform:	PC (PC-LAN)
	Operating system:	OS/2 and DOS
	Development language:	n/a
	LAN protocol:	IBM NETBIOS, IPX
	Adaptation needed:	NO
	Industry specific:	Financial industry
	Function:	Stock and bond dealing
2.	Name:	Transaction Manager
	Hardware platform:	PC (PC-LAN)
	Operating system:	DOS
	Development language:	n/a
	LAN protocol:	IBM NETBIOS, IPX
	Adaptation needed:	NO
	Industry specific:	NO
	Function:	Database backend
3.	Name:	Window Manager
	Hardware platform:	PC (PC-LAN)
	Operating system:	DOS and OS/2
	Development language:	n/a
	LAN protocol:	IBM NETBIOS, IPX
	Adaptation needed:	NO
	Industry specific:	NO
	Function:	Frontend development tool
4.	Name:	FUTOP
	Hardware platform:	PC (PC-LAN)
	Operating system:	DOS
	Development language:	n/a
	LAN protocol:	IBM NETBIOS, IPX
	Adaptation needed:	NO
	Industry specific:	Financial industry
	Function:	Futures and options dealing

5.	Name:	FX Manager
	Hardware platform:	PC (PC-LAN)
	Operating system:	OS/2
	Development language:	n/a
	LAN protocol:	IBM NETBIOS, IPX
	Adaptation needed:	NO
	Industry specific:	Financial industry
	Function:	Currency arbitrage system
6.	Name:	PF Manager
	Hardware platform:	PC (PC-LAN)
	Operating system:	OS/2
	Development language:	n/a
	LAN protocol:	IBM NETBIOS, IPX
	Adaptation needed:	NO
	Industry specific:	Financial industry
	Function:	Portfolio management
7.	Name:	Net-Op
	Hardware platform:	PC (PC-LAN)
	Operating system:	DOS and Windows
	Development language:	n/a
	LAN protocol:	IBM NETBIOS, IPX
	Adaptation needed:	NO
	Industry specific:	NO
	Function:	LAN management tool

Export Experience:

Current distribution channels: Subsidiaries and VARs

Export products:

Name	Target country	No. years
Dealermanager	Sweden/Norway/UK	1
Transitionmgr.	Europe	4
Net-Op	all over Europe	n/a

Per cent of revenue from export: 1990: n/a 1991: n/a

Export expansion is planned in: n/a

Interested in joint ventures: YES

What Canadian Product Types Is DanWare Data A/S Interested in Distributing?

DanWare Data A/S is not, as a general rule, interested in distributing third-party products because they feel they need to be able to do real-time development maintenance owing to the critical role of availability and reliability in the financial industry. However, they will not rule out the possibility of starting distribution of third-party products if the product is right and if maintenance could be managed by DanWare Data A/S.

DanWare Data A/S did not wish to comment further at this time on what they require of a potential Canadian joint-venture partner or on areas of interest for distribution.

6.8 An Unidentified Graphical Software Publisher

Address: Those interested in the name of this company, should contact the Canadian Embassy in Copenhagen.

1st Contact: David Horup

	1989	1990	1991 (Est.)
Revenue (MCDN$):	14	14	n/a
Employees:	110	110	110
Developers:	25	25	25

Product and Business Summary:

The company in question develops colour computer graphics software for a wide variety of applications, especially technical data presentation, contouring, mapping and business graphics. The applications run mainly under MVS on DEC VAX mainframes, minis and workstations.

Main Areas of Business:

Own development of standard applications	YES
Custom proprietary application development	NO
Body-shopping	NO
Fixed price enterprise projects	NO
Facilities management	NO
Hardware supplier (of CPUs)	NO
Service bureau	NO

Product Portfolio (own development only):

1.	Name:	
	Hardware platform:	VAX-VMS
	Operating system:	UNIX, VMS
	Development language:	C + FORTRAN
	LAN protocol:	n/a
	Adaptation needed:	NO
	Function:	Colour graphics presentation
2.	Name:	
	Hardware platform:	VAX-VMS
	Operating system:	UNIX - VMS
	Development language:	C + FORTRAN
	LAN protocol:	n/a
	Adaptation needed:	NO
	Function:	Colour graphics presentation
3.	Name:	
	Hardware platform:	VAX-VMS
	Operating system:	UNIX, VMS
	Development language:	C + FORTRAN
	LAN protocol:	n/a
	Adaptation needed:	NO
	Function:	Colour graphics presentation

Export Experience:

Current distribution channels: Distributors and VARs

Export products:

Name	Target country	No. years
	Scandinavia	8-10
	USA	8-10
	UK	8-10
	France	8-10
	Germany	8-10
	Italy	8-10
	Japan	8-10
	Spain	8-10
	Switzerland	8-10
	Holland	8-10
	Canada	8-10
	Singapore	8-10
	Korea	8-10

Per cent of revenue from export: 1990: 95 per cent 1991: 98 per cent

Export expansion is planned in: n/a

Interested in joint ventures: YES

What Does the Firm Require of a Canadian Joint-venture Partner?

The company is interested in a joint-venture partner that could be involved in a joint development project. The project would be executed in three phases:

- the company and a Canadian partner define a product jointly,
- the Canadian partner develops the product,
- the company sells the product through its distribution channels.

A potential Canadian partner should have experience in C, UNIX and VMS development under X-Windows. A potential Canadian partner must be willing and able to take on the distribution of certain applications in Canada.

What Canadian Product Types Is the Firm Interested in Distributing?

With its strong distribution channels, the company is an attractive potential joint-venture partner. During the last eight to ten years, it has had extensive export experience in 15 countries, of which ten are in Europe. Most of this experience is with wholly-owned subsidiaries. In technical terms, the company is looking for applications in the area of numerical analysis, statistics, fluid dynamics and graphical design systems. In order to gain leverage with the company's installed base of clients the ideal products to distribute through the company should, as a minimum, run on the DEC VAX platform under VMS, Ultrix. Other technical workstations under UNIX variations should be supported.

What Specific Export Experience Has the Firm Had?

The company is the most export-oriented of all the Software publishers we investigated in this context. Between 95 and 98 per cent of the 19 million CDN$ revenue is derived from export through wholly-owned subsidiaries. At the heart of the distribution strategy lies a consistent principle of local management, sales and support. The strategy of local management might seem expensive to implement; however, by discharging cultural and language barriers, the strategy is likely to be profitable.

6.9 Dansk System Industri DSI ApS

Address: Kokkedal Industripark 2 ❑ 2980 Kokkedal

Phone: 42 24 36 00

1st Contact: Jan Otzen

	1989	1990	1991 (Est.)
Revenue (MCDN$):	14	14	n/a
Employees:	15	15	15
Developers:	10	10	10

Product and Business Summary:

Dansk System Industri DSI ApS's main product is called DSI System, an integrated PC-based general office productivity package that includes a database and wordprocessor as well as a macro-oriented programming language. Dansk System Industri DSI ApS has developed a hospital application for managing the loan of aid tools for the handicapped, which is developed using DSI System.

Main Areas of Business:

Own development of standard applications	YES
Custom proprietary application development	YES
Body-shopping	YES
Fixed price enterprise projects	YES
Facilities management	NO
Hardware supplier (of CPUs)	NO
Service bureau	NO

Product Portfolio (own development only):

1.	Name:	DSI SYSTEM
	Hardware platform:	PC
	Operating system:	DOS
	Development language:	TURBO PASCAL and Assembler
	LAN protocol:	DOS based PC-LANs
	Adaptation needed:	NO
	Industry specific:	n/a
	Function:	Integrated package

Export Experience:

Current distribution channels: Distributors

Export products:

Name	Target country	No. years
DSI System	Germany	1
	Spain	2
	Norway	2

Per cent of revenue from export: 1990: 2 per cent 1991: 5 per cent

Export expansion is planned in: UK, The Far East and North America

Interested in joint ventures: YES

What Does the Firm Require of a Canadian Joint-venture Partner?

Dansk System Industri DSI ApS is specifically interested in a joint venture with the objective of starting to export to North America their Integrated Package DSI System, containing a database, word processor and calendar function.

Dansk System Industri DSI ApS did not wish to comment further at this time on what they require of a potential Canadian joint-venture partner or on areas of interest for distribution.

6.10 Procoss A/S

Address: Bregnerødvej 144 ❑ 3460 Birkerød

Phone: 45 82 22 00

1st Contact: Finn Ritslev

	1989	1990	1991 (Est.)
Revenue (MCDN$):	n/a	n/a	n/a
Employees:	70	90	n/a
Developers:	n/a	n/a	n/a

Main Areas of Business:

Own development of standard applications	YES
Custom proprietary application development	YES
Body-shopping	YES
Fixed price enterprise projects	YES
Facilities management	YES
Hardware supplier (of CPUs)	YES
Service bureau	NO

Product Portfolio (own development only):

1.	Name:	Easy Map
	Hardware platform:	IBM compatible (UNIX is under development)
	Operating system:	OS/2 (UNIX)
	Development language:	C, Oracle, Excel spreadsheet
	LAN protocol:	MAP, Tokenring, Ethernet
	Adaptation needed:	No
	Industry specific:	Process control
2.	Name:	Process Controlsystem 800
	Hardware platform:	Danish hardware
	Operating system:	X-AMOS
	Development language:	Specially developed in Denmark
	LAN protocol:	Danish proprietary net
	Adaptation needed:	YES
	Industry specific:	Process control

Export Experience:

Current distribution channels: Distributors

Export products:

Name	Target country	No. years
Easy Map	Germany	5
	France	5
	Sweden	5-10
	US	1
	Australia	1
	Japan	1

Per cent of revenue from export: 1990: 50 per cent 1991: 50 per cent

Export expansion is planned in: No limits — all over the world

Interested in joint ventures: YES

What does Procoss A/S Require of a Canadian Joint-venture Partner?

Procoss A/S has 15 years of experience with the world-wide export of process control manufacturing applications, ranging from the planning and management control phase to monitoring and dispatch. Some of the solutions have been delivered as turnkey projects. The Procoss PCS 800 application is directed at the pharmaceutical, chemical (pulp and paper) and food industries. Currently, there are 200 systems installed across Europe and the US.

Procoss A/S did not wish to comment further at this time on what they require of a potential Canadian joint-venture partner or on areas of interest for distribution.

6.11 Damgaard Data A/S

Address: Bregnerødvej 133 ❑ Postboks 260

Phone: 45 82 32 00

1st Contact: Director Erik ❑ Damgaard

2nd Contact: Michael Sander ❑ Marketing Manager

	1989	1990	1991 (Est.)
Revenue (MCDN$):	8	12	14
Employees:	50	80	n/a
Developers:	6	10	n/a

Product and Business Summary:

Damgaard Data A/S's primary application is a modular integrated PC-based financial package including modules for finance, debitor, creditor, invoicing, stock management, orders and project management. Damgaard Data A/S also distributes SuperCalc 5, SuperProject, DSI System, PC Plus and Novell NetWare.

Main Areas of Business:

Own development of standard applications	YES
Custom proprietary application development	NO
Body-shopping	YES
Fixed price enterprise projects	YES
Facilities management	NO
Hardware supplier (of CPUs)	NO
Service bureau	NO

Product Portfolio (own development only):

1.	Name:	CONCORDE
	Hardware platform:	Midrange Systems and PC
	Operating system:	DOS, OS ans Ultrix
	Development language:	C
	LAN protocol:	PC based LANs
	Adaptation needed:	No
	Function:	Financial system

Export Experience:

Current distribution channels: Distributors

Export products:

Name	Target country	No. years
Concorde	Norway	2
	UK	0.5
	Singapore	0.5

Per cent of revenue from export: 1990: 5 per cent 1991: 5 per cent

Export expansion are planned in: n/a

Interested in joint ventures: YES

What Does Damgaard Data A/S Require of a Canadian Joint-venture Partner:

Damgaard Data A/S is mainly interested in straight distribution through their outlets (500 in Denmark and 100 in the UK). In terms of localization, they expect the potential Canadian partner to invest in the necessary translation. Joint development cooperation is possible in the area of C development on the PC and midrange platform.

What Canadian Product Types Is Damgaard Data A/S Interested in Distributing?

Damgaard Data A/S will expect high quality products that are potential market leaders running primarily on PCs and PC LANs. They are not interested in distributing any economy packages, as they feel these might displace their own package. Damgaard Data A/S currently has distribution rights to a Danish product called DSI and to Computer Associate products. The firm has already established distribution of Local Area Network (LAN) products from a Canadian company called Pure Data, whom they suggest as a reference. Damgaard Data A/S is interested in finding a Canadian distributor for their in-house developed PC-based economy package, Concorde. They currently obtain approximately 50 per cent of their revenue from distributing third-party products; consequently, they would be extremely interested in finding suitable database application tools for distribution in Denmark.

What Specific Export Experience Has Damgaard Data A/S Had?

Export takes a lot of patience. That was the frequently repeated key message, especially when exporting to England, where the traditional "stiff" business practices combined with the very intense competition in the English market require unique products and a lot of patience. The English software market is probably the most competitive in Europe.

6.12 Vicorp Scandinavia A/S

Address: Vallensbækvej 22A ❑ 2605 Brøndby

Phone: 44 43 00 55

1st Contact: Jens Korning

	1989	1990	1991 (Est.)
Revenue (MCDN$):	n/a	n/a	n/a
Employees:	n/a	15	20
Developers:	n/a	n/a	n/a

Product and Business Summary:

Vicorp Scandinavia A/S is a Vicorp Group company marketing the videotex system BETEX throughout Europe and, to some extent, the Far East. From a technical point of view, Vicorp Scandinavia A/S develops software under UNIX for the HP and Tandem platforms.

Main Areas of Business:

Own development of standard applications	YES
Custom proprietary application development	YES
Body-shopping	NO
Fixed price enterprise projects	YES
Facilities management	YES
Hardware supplier (of CPUs)	YES
Service bureau	YES
Other: Consulting	YES

Product Portfolio (own development only):

1.	Name:	SKL
	Hardware platform:	UNIX, HP and Tandem
	Operating system:	UNIX, Guardian
	Development language:	C
	LAN protocol:	X/25, TCP-IP
	Adaptation needed:	NO
	Industry specific:	n/a
2.	Name:	Mailbox
	Hardware platform:	UNIX, HP and Tandem
	Operating system:	UNIX
	Development language:	n/a
	LAN protocol:	n/a
	Adaptation needed:	n/a
	Function:	E-mail

Export Experience:

Current distribution channels: Subsidiaries

Export products:

Name	Target country	No. years
Concorde	Most of Europe	11

Per cent of revenue from export: 1990: 15 per cent 1991: 25 per cent

Export expansion is planned in: Deeper coverage of existing markets

Interested in joint ventures: YES

What Does Vicorp Scandinavia A/S Require of a Canadian Joint-venture Partner?

Vicorp Scandinavia A/S is a subsidiary of the European headquarters of Vicorp, registered in Switzerland and located in Belgium (Brussels). They are the European market leaders in terms of market shares on Videotex, with subsidiaries in the US, Denmark, Sweden, Germany, the Netherlands, Belgium, Switzerland, France and distributors in Norway, Finland, Spain and Italy. Through their German subsidiary, they are exporting into Yugoslavia and Hungary and being paid in German Marks. To obtain Europe-wide partnerships, the potential Canadian joint-venture partner should first approach the headquarters in Brussels. However, some of the development is decentralized to the subsidiaries, and the Scandinavian subsidiary of Vicorp (which is located in Denmark) has locally-developed external communication products. In terms of future export target markets, Vicorp is looking for partners to penetrate the Far East, which is one of the last markets Vicorp has not yet penetrated.

What Canadian Product Types Is Vicorp Scandinavia A/S Interested in Distributing?

Vicorp Scandinavia A/S is interested in Canadian joint ventures, either with companies that have products within Voice-mail, Voice-response and Videotex or with companies that have industry-specific applications that are compatible with their existing Videotex platform. It is particularly interested in partners that offer knowledge in EDI, X.400 and other external communication technologies.

What Specific Export Experience Has Vicorp Scandinavia A/S Had?

Vicorp's core strategy is to distribute through wholly- or partly-owned subsidiaries, where Vicorp always maintains a majority interest. However, the company's centralized financial control stands in contrast to its normal principle of decentralization, since they always employ local management and sales staff in order to overcome local cultural barriers and ensure understanding of local business practices.

Table 7.1	Overview of Survey of Danish Software Publishers (Sample = 80, Non-response = 32) TOTAL SAMPLE SORTED ALPHABETICALLY								
Software Publisher	**NI**	**OD**	**EX S**	**EX E**	**EX O**	**EX P**	**CDE**	**JV**	**R91**
Bimco Informatiqe A/S	x	x	x	x	x			x	5
Bording Data A/S		x	x			x		x	100
Brugerdata Jordbrug A/S	x	x	x					x	2,1
CE Data A/S		x	x			x		x	500
Cincom Systems of DK		x	x						25
Citi Data A/S		x				x		x	10
CMA Software A/S		x	x	x	x	x		x	38
Consab Konsulent A/S		x	x			x		x	na
CRI A/S				x		x		x	250
Crone & Koch EDB						x		x	60
DAC Data A/S		x	x	x		x		x	94
Daisy Dandish Sys. A/S		x		x		x		x	1,400
Damgaard Data A/S		x	x	x	x		x	x	85
Dannet A/S		x	x		x	x		x	110
Dansk System Industri A/S		x	x	x		x		x	30
DanWare Data A/S		x	x	x				x	na
Datama A/S		x		x				x	32
EDB Gruppen A/S		x	x	x	x	x		x	150
ErrPage A/S		x		x	x	x		x	40
F8 Data A/S	x	x				x		x	na
FK Data	x	x							na
FLS Data A/S		x				x	x	x	120
Integreret Data Consult DK	x								8
JDC Data A/S		x	x	x	x	x		x	365
Kampsax Data A/S		x	x					x	40
KD Data A/S						x		x	114,5
KTP Data A/S		x					x	x	14
Kyborg Data	x	x				x		x	3,5
LEC	x	x	x					x	na
Linex Data-Technic A/S		x		x	x	x		x	na
Medex A/S		x	x			x		x	na
Mentor Informatic A/S	x							x	45
Nord Data A/S		x				x		x	50
Pro:Con A/S		x	x	x	x	x		x	48
Programatic A/S	x								70
Prolog Development Center		x		x				x	16
Procoss A/S		x	x	x	x			x	na
PS - Group A/S	x	x				x		x	8
ScanPoint A/S		x	x			x		x	60
Sypro Copenhagen A/S			x	x				x	18
Systematic Software A/S		x	x	x	x	x		x	na
TPI -Tom Pedersen Int. A/S	x								37
TR Partner		x	x					x	17,5
TRI Data A/S	x	x							na
Uniras A/S		x	x	x	x	x	x	x	90
Vicorp Scandinavia A/S		x	x	x		x		x	na
WM Data Konsulent A/S		x	x			x		x	42
ØK Data ApS	x	x							214

NI = Not of interest
OD = Own Development
EX S = Export to Scandinavia
EX E = Export to Europe
EX O = Export to Other
EX P = Export expansion planned
CDE = Distribution of Canadian products
JV = Interest in joint ventures
R 91 = Revenue est. for F1991

Table 7.2	Overview of Survey of Danish Software Publishers (Sample = 80, Non-response = 32) TOTAL SAMPLE SORTED BY REVENUE								
Software Publisher	**NI**	**OD**	**EX S**	**EX E**	**EX O**	**EX P**	**CDE**	**JV**	**R91**
Daisy Dandish Sys. A/S		x		x		x		x	1,400
CE Data A/S		x	x			x		x	500
JDC Data A/S		x	x	x	x	x		x	365
CRI A/S				x		x		x	250
ØK Data ApS	x	x							214
EDB Gruppen A/S		x	x	x	x	x		x	150
FLS Data A/S		x				x	x	x	120
KD Data A/S						x		x	114,5
Dannet A/S		x	x		x	x		x	110
Bording Data A/S		x	x			x		x	100
DAC Data A/S		x	x	x		x		x	94
Uniras A/S		x	x	x	x	x	x	x	90
Damgaard Data A/S		x	x	x	x		x	x	85
Programatic A/S	x								70
ScanPoint A/S		x	x			x		x	60
Crone & Koch EDB						x		x	60
Nord Data A/S		x				x		x	50
Pro:Con A/S		x	x	x	x	x		x	48
Mentor Informatic A/S	x							x	45
WM Data Konsulent A/S		x	x			x		x	42
ErrPage A/S		x		x	x	x		x	40
Kampsax Data A/S		x	x					x	40
CMA Software A/S		x	x	x	x	x		x	38
TPI-Tom Pedersen Int. A/S	x								37
Datama A/S		x		x				x	32
Dansk System Industri A/S		x	x	x		x		x	30
Cincom Systems of DK		x	x						25
Sypro Copenhagen A/S			x	x				x	18
TR Partner		x	x					x	17,5
Prolog Development Center		x		x				x	16
KTP Data A/S		x					x	x	14
Citi Data A/S		x				x		x	10
PS - Group A/S	x	x				x		x	8
Integreret Data Consult DK	x								8
Bimco Informatiqe A/S	x	x	x	x	x			x	5
Kyborg Data	x	x				x		x	3,5
Brugerdata Jordbrug A/S	x	x	x					x	2,1
F8 Data A/S	x	x				x		x	na
FK Data	x	x							na
LEC	x	x	x					x	na
TRI Data A/S	x	x							na
Linex Data-Technic A/S		x		x	x	x		x	na
Procoss A/S		x	x	x	x	x		x	na
Systematic Software A/S		x	x	x	x	x		x	na
Vicorp Scandinavia A/S		x	x	x		x		x	na
DanWare Data A/S		x	x	x				x	na
Consab Konsulent A/S		x	x			x		x	na
Medex A/S		x	x			x		x	na

NI = Not of interest
OD = Own Development
EX S = Export to Scandinavia
EX E = Export to Europe
EX O = Export to Other
EX P = Export expansion planned
CDE = Distribution of Canadian products
JV = Interest in joint ventures
R 91 = Revenue est. for F1991

Table 7.3	Overview of Survey of Danish Software Publishers (Sample = 80, Non-response = 32) SUBSELECTION OF INTERESTING SOFTWARE PUBLISHERS WITH OWN DEVELOPMENT								
Software Publisher	**NI**	**OD**	**EX S**	**EX E**	**EX O**	**EX P**	**CDE**	**JV**	**R91**
ØK Data ApS	x	x							214
PS - Group A/S	x	x				x		x	8
Bimco Informatiqe A/S	x	x	x	x	x			x	5
Kyborg Data	x	x				x		x	3,5
Brugerdata Jordbrug A/S	x	x	x					x	2,1
F8 Data A/S	x	x				x		x	na
FK Data	x	x							na
LEC	x	x	x					x	na
TRI Data A/S	x	x							na
Programatic A/S	x								70
Mentor Informatic A/S	x							x	45
TPI-Tom Pedersen Int. A/S	x								37
Integreret Data Consult DK	x								8
Bording Data A/S		x	x			x		x	100
CE Data A/S		x	x			x		x	500
Cincom Systems of DK		x	x						25
Citi Data A/S		x				x		x	10
CMA Software A/S		x	x	x	x	x		x	38
Consab Konsulent A/S		x	x			x		x	na
DAC Data A/S		x	x	x		x		x	94
Daisy Dandish Sys. A/S		x		x		x		x	1,400
Damgaard Data A/S		x	x	x	x		x	x	85
Dannet A/S		x	x		x	x		x	110
Dansk System Industri A/S		x	x	x		x		x	30
DanWare Data A/S		x	x	x				x	na
Datama A/S		x		x				x	32
EDB Gruppen A/S		x	x	x	x	x		x	150
ErrPage A/S		x		x	x	x		x	40
FLS Data A/S		x				x	x	x	120
JDC Data A/S		x	x	x	x	x		x	365
Kampsax Data A/S		x	x			x		x	40
KTP Data A/S		x					x	x	14
Linex Data-Technic A/S		x		x	x	x		x	na
Medex A/S		x	x			x		x	na
Nord Data A/S		x				x		x	50
Pro:Con A/S		x	x	x	x	x		x	48
Prolog Development Center		x		x				x	16
Procoss A/S		x	x	x	x	x		x	na
ScanPoint A/S		x	x			x		x	60
Systematic Software A/S		x	x	x	x	x		x	na
TR Partner		x	x					x	17,5
Uniras A/S		x	x	x	x	x	x	x	90
Vicorp Scandinavia A/S		x	x	x		x		x	na
WM Data Konsulent A/S		x	x			x		x	42
CRI A/S				x		x		x	250
KD Data A/S						x		x	114,5
Crone & Koch EDB						x		x	60
Sypro Copenhagen A/S			x	x				x	18

NI = Not of interest
OD = Own Development
EX S = Export to Scandinavia
EX E = Export to Europe
EX O = Export to Other
EX P = Export expansion planned
CDE = Distribution of Canadian products
JV = Interest in joint ventures
R 91 = Revenue est. for F1991

Table 7.4	Overview of Survey of Danish Software Publishers (Sample = 80, Non-response = 32) SUBSELECTION OF INTERESTING SOFTWARE PUBLISHERS WITH OWN DEVELOPMENT AND EXPORT TO SCANDINAVIA								
Software Publisher	**NI**	**OD**	**EX S**	**EX E**	**EX O**	**EX P**	**CDE**	**JV**	**R91**
ØK Data ApS	x	x							214
PS - Group A/S	x	x				x		x	8
Bimco Informatiqe A/S	x	x	x	x	x			x	5
Kyborg Data	x	x				x		x	3,5
Brugerdata Jordbrug A/S	x	x	x					x	2,1
F8 Data A/S	x	x				x		x	na
FK Data	x	x							na
LEC	x	x	x					x	na
TRI Data A/S	x	x							na
Programatic A/S	x								70
Mentor Informatic A/S	x							x	45
TPI-Tom Pedersen Int. A/S	x								37
Integreret Data Consult DK	x								8
Bording Data A/S		x	x			x		x	100
CE Data A/S		x	x			x		x	500
Cincom Systems of DK		x	x						25
CMA Software A/S		x	x	x	x	x		x	38
Consab Konsulent A/S		x	x			x		x	na
DAC Data A/S		x	x	x		x		x	94
Damgaard Data A/S		x	x	x	x		x	x	85
Dannet A/S		x	x		x	x		x	110
Dansk System Industri A/S		x	x	x		x		x	30
DanWare Data A/S		x	x	x				x	na
EDB Gruppen A/S		x	x	x	x	x		x	150
JDC Data A/S		x	x	x	x	x		x	365
Kampsax Data A/S		x	x					x	40
Medex A/S		x	x			x		x	na
Pro:Con A/S		x	x	x	x	x		x	48
Procoss A/S		x	x	x	x	x		x	na
ScanPoint A/S		x	x			x		x	60
Systematic Software A/S		x	x	x	x	x		x	na
TR Partner		x	x					x	17,5
Uniras A/S		x	x	x	x	x	x	x	90
Vicorp Scandinavia A/S		x	x	x		x		x	na
WM Data Konsulent A/S		x	x			x		x	42
Linex Data-Technic A/S		x		x	x	x		x	na
Citi Data A/S		x				x		x	10
Daisy Dandish Sys. A/S		x		x		x		x	1,400
Datama A/S		x		x				x	32
ErrPage A/S		x		x	x	x		x	40
FLS Data A/S		x				x	x	x	120
KTP Data A/S		x					x	x	14
Nord Data A/S		x				x		x	50
Prolog Development Center		x		x				x	16
CRI A/S				x		x		x	250
KD Data A/S						x		x	114,5
Crone & Koch EDB						x		x	60
Sypro Copenhagen A/S			x	x				x	18

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EX S = Export to Scandinavia
EX E = Export to Europe
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EX P = Export expansion planned
CDE = Distribution of Canadian products
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Table 7.5	Overview of Survey of Danish Software Publishers (Sample = 80, Non-response = 32) SUBSELECTION OF INTERESTING SOFTWARE PUBLISHERS WITH OWN DEVELOPMENT AND EXPORT TO SCANDINAVIA AND THE REST OF EUROPE								
Software Publisher	**NI**	**OD**	**EX S**	**EX E**	**EX O**	**EX P**	**CDE**	**JV**	**R91**
ØK Data ApS	x	x							214
PS - Group A/S	x	x				x		x	8
Bimco Informatiqe A/S	x	x	x	x	x			x	5
Kyborg Data	x	x				x		x	3,5
Brugerdata Jordbrug A/S	x	x	x					x	2,1
F8 Data A/S	x	x				x		x	na
FK Data	x	x							na
LEC	x	x	x					x	na
TRI Data A/S	x	x							na
Programatic A/S	x								70
Mentor Informatic A/S	x							x	45
TPI-Tom Pedersen Int. A/S	x								37
Integreret Data Consult DK	x								8
CMA Software A/S		x	x	x	x	x		x	38
DAC Data A/S		x	x	x		x		x	94
Damgaard Data A/S		x	x	x	x		x	x	85
Dansk System Industri A/S		x	x	x		x		x	30
DanWare Data A/S		x	x	x				x	na
EDB Gruppen A/S		x	x	x	x	x		x	150
JDC Data A/S		x	x	x	x	x		x	365
Pro:Con A/S		x	x	x	x	x		x	48
Procoss A/S		x	x	x	x	x		x	na
Systematic Software A/S		x	x	x	x	x		x	na
Uniras A/S		x	x	x	x	x	x	x	90
Vicorp Scandinavia A/S		x	x	x		x		x	na
Daisy Dandish Sys. A/S		x		x		x		x	1,400
Datama A/S		x		x				x	32
ErrPage A/S		x		x	x	x		x	40
Linex Data-Technic A/S		x		x	x	x		x	na
Prolog Development Center		x		x				x	16
Bording Data A/S		x	x			x		x	100
CE Data A/S		x	x			x		x	500
Cincom Systems of DK		x	x						25
Citi Data A/S		x				x		x	10
Consab Konsulent A/S		x	x			x		x	na
Dannet A/S		x	x		x	x		x	110
FLS Data A/S		x				x	x	x	120
Kampsax Data A/S		x	x					x	40
KTP Data A/S		x					x	x	14
Medex A/S		x	x			x		x	na
Nord Data A/?S		x				x		x	50
ScanPoint A/S		x	x			x		x	60
TR Partner		x	x					x	17,5
WM Data Konsulent A/S		x	x			x		x	42
CRI A/S				x		x		x	250
KD Data A/S						x		x	114,5
Crone & Koch EDB						x		x	60
Sypro Copenhagen A/S			x	x				x	18

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8. GLOSSARY

ADA

A computer language designed as a standard for US government and NATO procurements. ADA is a required language for mission critical projects.

AIX

The UNIX System V-type operating system delivered by IBM for its RS/6000 technical workstation, PS/2 and S/370.

AS/400

IBM's next-generation midrange system to replace the IBM S/36 and S/38 product families, and to be the flagship office system (SAA Office). Before the June 21, 1988 announcement, AS/400 was commonly referred to as "Silverlake".

Body-shopping

The sale of programmers, system designers and project management resources on a time material basis. Normally they are stationed at the customer's site as an integral part of the MIS department.

C

The programming language created by Dennis Ritchie of Bell Laboratories in 1972, when he and Ken Thompson worked on designing the UNIX operating system. It was based on Thompson's B language. It has found widespread use on personal computers and is one of the languages in which expert system shells are implemented.

CAD

Computer-aided Design

Client/Server

A concept of application deployment that functionally supports the notion of "application execution" as dispatchable units of work that are assigned to a network of servers (resources) that respond to the initiating client. Client/server embodies the general concepts of cooperative processing, distributed processing and networked processing. File and print servers represent a crude form of the client/server model. In full implementation, the client/server model provides a data processing and networking environment that offers:

- hardware, software and network platform independence (i.e., transparency);
- application delivery to an intelligent workstation (although an X-terminal-like device may suffice in some environments);
- a consistent user interface with the networked system (i.e., operational similarity); and
- flexibility of physical topology.

We believe the technology breakthroughs required to deliver the full model include:

- application development tools that support application deployment to a dynamic network of heterogeneous hard/software platforms;
- centralized network management on LANs;
- centralized management of distributed, relational databases;
- networked security; and
- work-flow management that balances work loads and coordinates the execution of units of work among disparate products (for example, a two-phase commit of a database update that involves the action of products from several different vendors).

We do not expect wide "corporate" acceptance and deployment of the model until 1993.

DOS

Disk Operating System. Commonly used to refer to the Microsoft developed DOS for Intel's 80X8X PCs (and known as MS-DOS). IBM markets MS-DOS as PC-DOS.

E-mail

Electronic Mail. Any communications service that permits the electronic transmission and storage of text messages.

EDI

Electronic Data Interchange. The electronic transfer between trading partners of preformatted business documents, such as purchase orders and bills of lading.

EDIFACT

EDI for Administration, Commerce and Transportation. An EDI standards development group.

ES/9000

A new family of processors that implement the IBM S/390 architecture. On the announcement (9/90), no compelling architectural differentiation was detailed over the capabilities of the ESA/370 functions. However, we believe that dramatic new features and functions (i.e., the "Future System" (FS) capabilities) will be announced within the first two years. We believe the ES/9000 models 900 and 820 are FS-"capable".

Ethernet

A baseband LAN developed by Xerox Corp. and supported by Intel Corp., DEC, Hewlett-Packard and a host of others. Ethernet has a bus topology with CSMA/CD access control.

FTAM

File Transfer, Access and Management. The OSI standard for file transfer (the communication of an entire file between systems), file access (the ability to access remotely one or more records in a file) and management (the ability to create/delete, name/rename, etc. a file).

Guardian

Tandem's operating system, which resides in each processor of a multiprocessor complex and manages the system resources as a single image.

LAN

Local Area Network

MAP

Manufacturing Automation Protocol. MAP is a communication specification that is specific for manufacturing users. It is part of the overall standards effort as defined by the Open Systems Interconnection (OSI) seven-layer architecture. Initially supporting only broadband physical media, future versions of MAP will also support fibre-optic lines.

NetBIOS

Network Basic Input/Output System. Extension of IBM's PC BIOS; traps calls to the BIOS and, when necessary, reroutes them to the local area network. NetBIOS was developed as the interface for the PC Network program, but is supported on the Token Ring Network and on a number of non-IBM systems. It will likely be a long-term tactical solution for local networking; the long-term strategic solution will be APPC/LU 6.2.

OEM

Original Equipment Manufacturer. A hardware vendor that resells the software (written by a software vendor) that runs on its system.

OLTP

On-Line Transaction Processing. A mode of processing (compared to batch and decision support) characterized by low cost, fast response time and high availability. In a broader sense, OLTP puts data on line where it can be updated instantly to reflect changes as they occur. In other words, the data processing models the actual business in real time, and a transaction transforms this model from one business state to another. Tasks such as reservation scheduling and inventory control are especially complex; all the information must be current, and each piece of information is related to every other piece. With constant change as the norm, coordination and integrity of the information are keys to a successful business operation.

OS/2

Operating System/2.

OS/400

Operating System/400. The operating system for IBM's AS/400 system.

PCM

Plug-Compatible Manufacturer. A hardware vendor whose products are direct replacements for the products of a computer systems manufacturer. Initially PCMs provided peripherals that were "plug-for-plug" compatible with IBM peripherals, but the PCM industry has since grown to include IBM-compatible mainframes and peripherals for other vendors' systems.

Presentation Manager

The graphical user interface in OS/2, which includes windowing, graphics, standards for the keyboard interface and editors for icons and fonts. It is the first manifestation of IBM's user interface architecture and is consistent with the CUA of SAA.

RDBMS

Relational Database Management System. In theory, a database is organized and accessed according to the relationship between data items expressed by means of tables. Data values, rather than pointers, express interdependences among these tables, enabling a high degree of data independence. In practice, the marketplace has determined that a RDBMS in one that is a SQL engine. We believe that is a sound judgement.

RPG

Report Program Generator. A programming language dominant in the S/3X and AS/400 arena.

SCO

Santa Cruz Operation.

SQL

Structured Query Language. A relational data language that provides a consistent, English keyword-oriented set of facilities for query, data definition, data manipulation and data control. It is a programmed interface to a relational database management system. IBM Research introduced SQL as the main external interface to System R, an experimental RDBMS developed in the 1970s.

SQL statements include:

- data manipulation language (DML) statements: SELECT, INSERT, UPDATE and DELETE;
- Data definition language (DDL) statements, including the CREATE and DROP statements for tables and indexes;
- statements that control data consistency, and grant and revoke authority.

Dynamic SQL statements are those not completely specified until program execution. Static SQL statements are completely specified when the program is complied. SQL is pronounced "Sequel".

TCP-IP

Transaction Control Protocol/Internet Protocol. A set of protocols for layer 3 and 4 (network and transfer) of the OSI network model. TCP/IP has been developed over a period of 15 years under the auspices of the Department of Defence. It is a *de facto* standard, particularly as high-level layers over Ethernet. Although it builds upon the OSI model, TCP/IP is not OSI compliant. Because of its popularity, however, we believe most vendors will continue to support TCP/IP after they have implemented true OSI interfaces.

Token Ring

A local area network access mechanism and topology in which all stations actively attached to the bus listen for a broadcast token or supervisory frame. It uses a ring-shaped layout and token-passing access method to carry data from device to device. IEEE 802.5 compliant LANs operate at 4 Mbps or 16 Mbps. Bus access is controlled by preassigned priority algorithms.

Ultrix

Digital Equipment Corp's version of UNIX, expected to evolve toward OSF's UNIX version OSF/1.

UNIX

A family of operating systems known for their relative hardware independence and portable applications interface; a time-sharing operating system available on all AT&T computers as well as those from many other vendors. Widely used in technical and scientific computing applications. UNIX System V is the version of UNIX supported by AT&T Unix Systems Laboratory (USL) and Unix International, Inc. (UII).

VAR

Value-added Reseller. An organization that buys equipment from a vendor at a discount from list price, adds value to it in some form (e.g., additional software features), then resells it.

Videotex

The generic term applied to two-way interactive electronic data transmission or home information retrieval systems, in which a home or office is linked in a communication grid providing direct access to distant computer centres with large information data banks.

VM

Virtual Machine. The IBM VM/Systems Product (VM/SP) manages a real system so that all its resources — processors, storage and input/output devices — are available to many users at the same time. Each user has at his disposal the functions of a real dedicated system. Because this functional equipment is simulated by VM/SP and does not really exist, it is called a "virtual machine".

VM is now a group of program products consisting of:

- VM/XA SP — strategic product for large environments with MVS/XA guests;
- VM/XA SP — tactical product for large environments; replaced by VM/XASP;
- VM/SP HPO — performance oriented large environments;
- VM/SP — intermediate environments;
- VM/SP System Offering — intermediate and low-end environments;
- VM/IS Base — intermediate and low-end environments
- VM/ESA — announced in September 1990, a new high-end product that exploits the capabilities of the ES/9000 product family.

VMS

Virtual Memory System. VAX/VMS is the primary operating system for the Digital Equipment Corp. VAX family of products.

VSE/ESA

A robust version of the venerable DOS/VSE operating system and announced by IBM in September 1990. VSE/ESA offers many of the functions of MSV/ESA (such as 31-bit addressing), but is still limited to a uni-processor environment. VSE/ESA, as announced, was not linked to the ES/9000 products; it operates on any XA or ESA uniprocessor.

Windows

The software system written by Microsoft Corp. to manage windows for Intel 80X86-based PCs. It uses multiple screen segments to display different items of information.

X-Windows

The software system written by the Massachusetts Institute of Technology for managing windows under UNIX. It is a graphics architecture, application programming interface and prototype implementation. X-Windows defines a client/server relationship between the application program and the workstation. It is not a complete graphics user interface (GUI), but rather the basis upon which one can be built.

X/25

A standard for packet-switching procedures developed by the CCITT that defined the interface between a public data network (PDN) and a packet-mode user device. It also defines the services that these user devices can expect from the X-25 PDN, including the ability to establish virtual circuits

through a PDN to another user device to move data from one device to another, and to release the virtual circuit when the session is over.

X/400

A CCITT-developed OSI application-layer function generally associated with electronic mail, but including other store-and-forward application needs.